THE ACCEPTANCE OF EVOLUTION AND A BELIEF IN LIFE ON OTHER PLANETS

JERRY BERGMAN*

Received 25 April 1994; Revised 3 August 1994

Abstract

Our belief structure highly influences our explanation and conclusions concerning ambiguous stimuli. When it was accepted by most Westerners that humans and all life were direct creations by God, if other worlds existed and had life, it must have also been created by God. Acceptance of non-theistic evolution indicated that if life evolved on earth, it could likewise have evolved elsewhere. This life could be either a "lower" or "higher" level than humankind, or an entirely different kind based on a non-carbon molecule. If many kinds and types of life exist elsewhere in the universe, their visits to earth became a real possibility.

Today, some exobiologists such as Carl Sagan and others have postulated that it is highly probable that life exists in many far off places in the universe. This paper hypothesizes a relationship between public belief in evolution and the number of modern claimed sightings of UFOs. Before the late 1940s there were almost no reports of UFOs. The acceptance of evolution, the first famous claimed sighting in 1947, the American space program, and the fear of invasion from foreign powers with advanced technology (especially the former Soviet Union) have all contributed to the phenomenal number of claimed UFO sightings since 1947.

Introduction

The topic of Unidentified Flying Objects (UFOs) has been awarded a tremendous amount of publicity in the last 40 years. Thousands of books and magazine articles have been devoted to it, most of which are written from the premise that many UFOs are objects from other planets controlled or flown by living non-earth creatures (Edwards, 1966, 1967; Tralins, 1974; Von Daniken, 1969, 1972; Menzel and Boyd, 1963; Chambers, 1967; Lorenzen, 1966; and Michel, 1956). Unfortunately, much of the material is not objective, well researched or adequately documented.

Widespread popular belief in the existence of UFOs, here defined as physical "spaceships" either from another planet or possibly from the inside of this planet, is quite recent (for a discussion of UFOs as a manifestation of demons, see Segraves, 1975; Wilson, 1972, 1974, 1975; Jansma, 1981; Allnutt, 1978; Weldon, 1976; Wells, 1975; Downing, 1968). As UFOs are usually believed to come from other solar systems, such phenomena could be accepted only when it was believed that other large earth-like planets existed in other solar systems. For much of history, most humans did not share our current world view that the earth was one of nine planets arranged in a heliocentric solar system. Except for God, angels, devils or other spiritual beings which did not need to travel in material machines, few persons in the Christian era in the West believed beings from other planets existed. As Sagan and Leonard (1972, p. 19) state "The world, as . . . [people who lived at the dawn of history] saw it or understood it, was a small patch of land bounded by distant hills and perhaps by the blue line of the sea." Although it is difficult to discern exactly how most ancients perceived the universe, the common people as well as many scholars generally saw the universe as only what it appeared to be from earth: the planets were fast moving stars, and the stars were often assumed to be fairly small objects which hung in the sky not too far away from the earth.

While widespread claimed UFO observations are a very recent phenomenon, people have been speculating about extraterrestrial intelligence (called the "plurality of worlds view") since at least the time of the ancient Greeks. The more important supporters of the concept of "many inhabited worlds" includes the Pythagoreans, the stoics such as Epicurus and his follower Lucretius and Plutarch, and the many atomists, including Democritus. Tipler (1981, p. 134) concludes that these individuals were "the most important supporters of the many inhabited worlds concept in antiquity." Many of these thinkers speculated that the size of the universe was enormous, and reasoned that we could not be the only beings in it, just as an ocean must have more fish than those that we see on a clear day.

Since relatively few manuscripts have survived from this period, it is difficult to speculate on the amount of concern and importance that these thinkers gave to this idea. Tipler (1981, p. 134) feels that the evidence allows the conclusion that "the most brilliant Greek thinkers were . . . opposed to the idea of a plurality of worlds." Those he cites include Plato and Aristotle, who both argued strongly against the view on a number of grounds. Because of the importance of Aristotle, Tipler (1981, p. 134) concludes that this belief "dominated thought until the time of Copernicus, and though the doctrine of a plurality of worlds . . . was occasionally discussed, it was rejected by most scholars, both pagan and Christian, in this period."

The Theological View

To Christian thinkers, the most important concern about the plurality-of-worlds idea was theological, especially related to sin and redemption. If other worlds exist with life and if this other Adam sinned, Christ's redemption would be required. If these humans never sinned, no redemption was needed, and this would seem to negate the Scriptures which stress that all humankind had sinned, presumably all referring not just to the earth, but to all humans everywhere. If this Scripture refers only to humans on the earth, and if beings elsewhere also required a Savior, this would negate the words of 1 Peter 3:18 where the saving work of Christ was believed to be unique (Armstrong, 1970). Influential early Christian thinkers from Augustine to

*Jerry Bergman, Ph.D., Northwest State College, Archbold, OH 54502.

Aquinas resolved the quandary by totally rejecting the plurality-of-worlds belief. They taught that the universe and the earth were created for humans only, and that we have no reason to believe that God has created other races of humans elsewhere (Steneck, 1976). In addition, many Christian scientists, including both Kepler and Galileo, opposed the plurality-of-worlds view, Galileo even denouncing it as "false and damnable." One of its few advocates during this period, Bruno, was executed for heresy (Singer, 1950).

Tipler (1981, p. 136) concludes that it was the Copernican revolution which gave a major boost to the plurality-of-worlds concept. In spite of the many arguments by most Christian thinkers against the concept of extraterrestrial intelligence, some, such as the influential St. Bonaventure, contended that "God could make a hundred worlds if He wished. He could suspend Aristotelian physics . . . and create one in a place which is beyond the fixed stars." In addition, Nicholas of Cusa, whose De docta ignorantia (1440) was the most influential book on cosmology until the seventeenth century accepted the plurality of worlds possibility (Tipler, 1981, p. 135).

It was not until the Renaissance in the fifteenth century that the western world began to seriously comprehend the basics of how our solar system of planets functioned. Although the heliocentric view of the universe was not totally new, but was postulated centuries previously by Eratosthenes, Aristarchus and others, most people, even the most learned, did not accept this view until the 1700s (Sagan and Leonard, 1972). One of the first researchers to scientifically defend a system with a sun at the center and the then known planets traveling around it in circular orbit was Nicholas Copernicus. Copernicus' 1543 book, *On the Revolution of Heavenly Bodies,* was a major step in comprehending the universe as we know it. Men such as Galileo, Kepler and others, although they did not agree with Copernicus in many areas, provided many details for the heliocentric view. As Tipler reasoned:

> . . . the telescope disclosed mountains on the moon and satellites around Jupiter. These observations suggested that the planets were similar to the Earth in gross structure. Second, the Earth was demoted from the status of being an enormous body in the center of the Universe to just one of six planets. To minds conditioned by the discovery of America in the previous century to see unknown lands on this planet inhabited, it took but a small application of the principle of plenitude [the assertion that what can exist, must exist somewhere, and if worlds like ours exist elsewhere in the Universe, they must be inhabited by intelligent beings since no genuine potentiality of being can remain unfulfilled] to envision the planets—regarded as distant lands—as inhabited also. Further, the telescope had revealed innumerable stars, which were regarded as Suns like our own (1981, p. 136).

Although a few thinkers had correctly addressed the shape and even the approximate size of the earth (e.g. Erathosthenes) most of the ancients entertained a view of our universe vastly different from our modern day picture. Thus Reichen argued:

> In a century and a half, from Copernicus to Newton, man's image of the universe had been totally transformed. It was far larger universe, far more complex, and far more remote from the earth (1963, p. 53).

It is not true that no one speculated about an infinite universe before this: "As early as 4 B.C., Metrodorus discussed an "infinite space," and Lucretius even wrote that "there are infinite worlds both like and unlike this world of ours" (Ferris, 1988, p. 369). These ideas, though, were pure speculation, and not widely accepted. Along with the modern realization that there were other "worlds" far away from the earth came the possibility that living beings may exist on these planets. This in itself, though, did not influence widespread belief in UFO phenomena for one important reason: until the turn of the century, it was almost universally believed that God had directly created humans and all life. Hence, if life existed on other planets, God must have created it. Consequently, the life there must be similar to that on earth. Further, because God was believed to be a loving heavenly Father, it was incomprehensible that He would create physical creatures on other planets which were grotesque, cruel, or naturally malicious towards the earth as often implied in early science fiction. The life on these other worlds would likely be more like Spielberg's E.T. in personality, but not physical appearance.

Those pre-Darwin scientists and church leaders who entertained the possibility of life on other inhabited planets concluded that, if other worlds exist, they "must have been created to be the abodes of other intelligent beings, just as the Earth had been created for human beings" by God (Tipler, 1981, p. 136). During this period, the major arguments and discussions about the plurality-of-worlds concept focused on the purpose of other worlds, and the theological problems that this concept created. The arguments against this view included: 1) either earth humans were the only physical creatures that God created; or if God created others, those on earth were the only ones to fall from grace. Some reasoned that since, aside from the angels, humans are the only creatures that God created which we know anything about, speculation is fruitless. Actually, a belief in the plurality of worlds produced so many serious theological difficulties for Christianity that many writers used it as an argument against Christianity as a whole. As Thomas Payne in his famous *Age of Reason*, a diatribe against Christianity, stated:

> . . . from whence then could arise the solitary and strange conceit, that the Almighty, who had millions of worlds equally dependent on His protection, should quit the care of all the rest, and come to die in our world, because they say one man and one woman had eaten an apple! And, on the other hand, are we to suppose that every world in the boundless creation had an Eve, and apple, a serpent, and redeemer? In this case, the person who is irreverently called the Son of God, and sometimes God himself, who would have nothing else to do than to travel from world to world, in an endless succession of death, with scarcely a momentary interval of life (Quoted in Tipler 1981, p. 139; interestingly, Payne's book, *Age of Reason*, is commonly reprinted by various atheistic associations, and all editions that I was able to locate omitted this quote).

The increasing acceptance of the evolutionary theory in the middle of the 1800s, spurred on by such workers as Darwin, Huxley, Haeckel and others, brought with it the belief that just as life on the earth evolved, life on other planets could have also developed on its own, only in different ways, depending on the environmental conditions there. In this world view, humans and animals were no longer seen as the product of an intelligent designer with a loving purpose, but as a result of natural law, chance and the brutal forces of competition which occurred in the impersonal natural world. And "If intelligent life has evolved on this planet it may have done so elsewhere" (Ferris, 1988, p. 368). As Buskirk (1979, p. 2) stated:

> . . . most who believe in life in outer space suppose it on the theory of evolution. An evolutionist would reason: If life evolved after millions of years on this planet, why couldn't it have done so elsewhere in the universe?

Ridpath argued that "Religions which contend that God made man in His own image could be severely shaken if we found another intellectual race made in a different image" (Quoted in White, 1988, p. 38).

Popularization of the Other Worlds Theory

Literature, especially science fiction, served to popularize this new view of the cosmos (see for example Verne, 1878). The first popular work about life from other planets was H. G. Wells' *War of the Worlds* (1895) which told of the story of grotesque monsters with tremendous powers that came to earth from Mars. These monsters were eventually destroyed, but not by human power. The Martians lacked immunity to earth's bacteria, and thus were "slain by the humblest things that God in His wisdom had put upon this earth." This book, although science-fiction, clearly conveyed the possibility of life on other planets. H. G. Wells' major interest in college was biology and evolution, a subject which he planned to teach. He reasoned that if life evolved by natural law on the earth, it likewise could have evolved on other planets, and this view played an important part in many of his novels. The evolutionary hypothesis is obvious throughout this internationally known classic (Bergman, 1993).

The possibility that living beings were inhabiting other planets became accepted to the extent that a 1938 radio dramatization of *War of the Worlds* by Orson Wells was mistakenly understood by many listeners as a genuine news report! The broadcast claimed that a meteor which had landed near Princeton, New Jersey proved to be hollow and men from Mars emerged from it. Armed with a horrible death ray gun, they slew all of the humans they came across as they marched to New York. The result of this broadcast was, as one newspaper stated, America became "convulsed by panic and hysteria." Many people believed the broadcast was real—so much so that hundreds of doctors and nurses called hospitals to volunteer their services. Men in the armed forces offered their help, and city officials began to work out mass evacuation plans (Cantril, 1966).

Because this scare was nationwide, the fervor was not due to local population peculiarities: Meetings were held in many places in America and Canada to make plans for defense. Some people actually poisoned themselves, preferring to die by their own hands than from the Martians' ray guns Cantril, 1966). A few years later in Mexico, the same broadcast caused a level of pandemonium that made the original broadcast events appear minor. This incident conveys the fact that many people in 1938 strongly believed in the possibility of intelligent life on other worlds—and that it could be malicious, and in some way very harmful to earth's people.

Stories such as *War* of *the Worlds* and *The First Men on the Moon* were openly influenced by evolutionary theory. Many other stories about space travel featuring odd, often malicious creatures from other planets soon became popular, including the Buck Rogers and Flash Gordon books and their later television series. With the realization that the universe is much larger than previously supposed, and the belief that life could evolve due purely to the forces of time and natural law, one's imagination was freed to create bizarre worlds in the huge unknown expanse that existed outside of the earth. Motion pictures with multi-million dollar budgets such as *Close Encounters of the Third Kind, Star Wars, E. T.* and others continued to popularize the idea that life evolved elsewhere in the universe.

Although the possibility of life on other planets and possible earth visits were occasionally discussed in literature prior to 1947, almost no one claimed to actually have seen what today would be called a UFO. The UFO phenomenon is generally thought to have begun in 1947 when businessman Keith Arnold, while flying his private plane near Mt. Ranier, Washington, claimed that he saw a cluster of several bright "metallic objects" dodging around the nearby mountain peak. Arnold somehow concluded that the objects had traveled between 1,200 and 1,500 miles per hour (Goeringer, 1979, p. 11). Since Arnold's report, scores of thousands of claimed sightings have occurred—some even accompanied by photographs—although the majority have proved to be fakes (Goeringer, 1979, p. 14). Later Arnold was credited with describing these unknown objects as resembling "pie plates," traveling like "saucers being skipped over water." Although, the phrase "flying saucer" attributed to Arnold is evidently a misquote (He said only that the objects flew and appeared wingless.) the phrase caught on and the terms "flying saucers" and "unidentified flying objects" (UFOs) are now universal.

Arnold's matter-of-fact way of conveying his story convinced so many people that within weeks, and for the first time in history, "flying saucer" reports started flooding in from all parts of the world. As a result, Evans (1973, p. 140) notes, "So widespread, and often so convincing were these reports that the American Air Force launched a full-scale investigation into them."

The few pre-1947 reports of such claims often discuss "ships in the air" or "ships in the clouds," Wilkins (1955, 1967) lists several accounts of "ships in the skies" dating back to 22 BC. Flying saucers as discussed in contemporary accounts are generally not described as anything like "ships in the skies" but considerably different. The objects described in ancient accounts appear to be natural astronomical phenomena such as shooting stars. At best, the limited evidence suggests that pre-1947 sightings were not perceived in the same way as flying saucers and similar objects are understood today. Some

were only stories relating various moral principles. Many investigators have concluded that the attempts to document many historical UFO sightings, such as by Von Daniken (1969, p. 1972), are all unconvincing.

Another factor which has influenced public acceptance of UFOs was the cold war. At the time of Arnold's sighting, the United States and the Soviet Union were involved in an active "psychological war." The development of the V-2 and later rockets was also frightening to many people (Menger, 1967). Some Americans feared that the Soviets may have some type of super intercontinental ballistic missile that could demolish us. The detonation of the atomic bomb, still fresh in people's minds then, caused a tremendous fear in many relative to the increased technology in this area (Rublowski, 1962). The United States was at this time in a state of constant alert and could not afford anything but maximum interest in unidentified flying aircraft stories, no matter how far-fetched. Consequently, an extensive research investigation of UFO citings was completed. Evidently, top-ranking officers in the Pentagon were fearful at one stage of their UFO investigation that the Soviets were testing some spectacular new super weapon. As the Air Force progressed in its 22-year-long investigation though,

> . . . the less inclined it was to the view that saucers were real craft of incredible performance, and the more readily they subscribed to prosaic explanations such as that the UFOs were weather baboons, meteorological phenomena, conventional aircraft whose distance and speed had been incorrectly judged, and so on (Evans, 1973, p. 141).

This extensive research, called "Project Blue Book," culminated in the 1968, 1,500 page Condon Report which is considered by many to be the final fatal "expose" of the UFO belief myth. In the report's words, "Further extensive study of UFOs probably cannot be justified in the expectation that science will be advanced thereby" (Quoted in Stacy, 1994, p. 56). These "official" denials, though, often only reinforced the conclusions of many UFO true believers (Ruppelt, 1956; Rublowski, 1962). The Blue Book project found most all UFOs were likely atmospheric phenomenon, weather disturbances, hoaxes, weather balloons, airplane lights, planets, or other explainable phenomenon. Although researchers were not able to explain fully many claims, this is understandable when all that exists are eye witness accounts from untrained observers. Nonetheless, not one case was determined to be a verified case of physical beings from other planets.

Arguments Against the View that Life from Other Solar Systems Could Visit Earth

The closest star which Evans (1973) describes as "rather freakishly close." Alpha Centauri, is about 25-quadrillion miles or 4.2-4.3 light years away. Traveling at 186 thousand miles a second, a round trip to it would take earthlings over 9.2 years. The fastest known space craft does not travel even close to this speed, but only a few thousand miles per hour. At present day speeds, it would take about 100,000 years to reach the three stars in this area, and we have no clear evidence that the closest star (or any other) has any planets. The most optimistic "dream" estimate of the shortest time ever possible is about 150 years or about five generations, which would equal 300 years for a round trip.

By using two or three stages, some estimate that chemical rockets may achieve, at most, a speed of 2,000 miles per second (Lunan, 1974, p. 22). Bolin estimates that possibly as much as 60% of the speed of light could be achieved in the distant future but, as measured from earth, a ship traveling at this speed would still require something like 18 years to travel the 10 light years needed for a trip to the second closest star! Unfortunately, a tremendously large amount of supplies must be included to make the round trip of 36 years, including food, oxygen, and something to prevent the crew from going insane (How many persons could live in a small rocket ship traveling in space for 35 or more years?).

Although it is possible that rockets could be developed to travel at immense speeds, and that some superscientific civilization might have developed such, we have no evidence that this is the case. As Clarke (1968) stated, we will have to settle for space-age fliers that putter along at a mere tens of thousands of miles per hour. Our knowledge of physics, chemistry and space travel is such that it seems improbable that we will ever reach speeds significantly greater than that presently obtained. Edwards adds:

> May not some super-scientific civilization have developed a method of travel which transcends our puny knowledge of the laws of space and time so that their craft can leap across the stellar waste in a twinkle of an eye? This, of course, is conceivable in the sense that all things are theoretically possible, but here the UFO protagonist has moved. . . into the swamp of pure guesswork . . . (1966, p. 3)

Einsteinian theory has demonstrated that time slows down and mass increases as we approach the speed of light. Thus, it would take an infinite amount of energy to travel the speed of light, making it impossible to travel faster than the speed of light (Landau and Rumor, 1966, p. 83; see also Good, 1968; Gardner, 1965; Coleman, 1954). The warp drive, arc-cutting and warped space theories are all attempts, so far inadequate, to overcome this distance problem. Many other scientific arguments against the extra-terrestrial view exist (Barrow and Tipler, 1986).

Thus, because of tremendous distances—Andromeda, the nearest galaxy to the Milky Way galaxy, is over 2,000,000 light years away from the earth—a space craft could not reach the earth unless it could travel many times the speed of light. A space craft from here would have to begin its trip long before life ever existed on the earth, and might not arrive until long after life ceased to exist here. And, given the vastness of space, how would the visitors know where and when to go? Thus, it seems highly improbable that UFOs could ever reach earth from outside of the solar system. UFOs cannot exist if there is nowhere that they could come from in time to experience life on earth. The problem is illustrated by Ferris as follows:

> One might search for life beyond the solar system by traveling to the stars, but to do so within any reasonable amount of time is a very tall order indeed. The stars are just too far away: A spacecraft capable of traveling a million miles per hour—and this would be a stunningly fast ship, one that

> could fly from Earth to Mars in less than an hour-would take nearly three thousand years to reach Alpha Centauri, the nearest star. If the expeditionaries proceeded to the next promising star—Delta Pavonis, spectral class F8, would be a reasonable choice—and then hastened on to, say, Beta Hydri, and then kept going to Zeta Tucanae before stopping for a well-earned rest, they would have succeeded in visiting about one one-hundred billionth of the stars in the galaxy—a sample statistically less significant than attempting to understand all Shakespeare's writings by examining only two letters from one of his sonnets (1988, p. 371).

The origin of UFOs is sometimes attributed to areas within the solar system, including such planets as Mars, Venus, and sometimes even Neptune and Uranus (Michel, 1956; Bernard, 1979). The recent space probes though, have provided no evidence whatsoever that life does and a tremendous amount of evidence now exists to support the position that life does not and cannot exist on these planets (Wells, 1975). Mars, Venus, Jupiter and Saturn have all been found to contain either extremely poisonous gases or almost no life supporting gases in their atmosphere.

Another explanation for the source of UFO spaceships is the belief that earth has a "sister" planet. Proponents of this idea propose that a planet equal in size to the earth traveling at the same speed, but directly on the other side of the sun. It is for this reason that it has never been seen from the earth. If it existed, though, it would cause a gravitational pull not only upon the earth, but also on the other planets. This gravitational pull has never been detected. The discovery of Pluto was partly due to the assumption that Neptune's "improper" orbit may be explained by the presence of another planet farther out. Although it is now known that this influence would be small, scientists hypothesized where this planet should be, and in time found it (Hoyt, 1981).

If material, physical UFOs exist that are not figments of the imagination garnered to create publicity or pecuniary remuneration, nor such things as sunspots or weather phenomena, they must be some type of aircraft developed by governments or individuals. Consequently, if UFOs exist as material objects, they probably come from the earth—a far less exotic and exciting hypothesis than the perception that they are real extraterrestrial spaceships. And, indeed, some UFOs have been found to be ingenious aircraft developed by enterprising inventors.

Many writers have noted the connection between UFOs and theology (Evans, 1973; Wilson, 1972, 1974; Downing, 1968; and Freeman, 1969). One of the more recent brief reviews of UFOs and religion, completed by Goeringer (1979), concludes that UFOs have to some degree replaced religion by (1) giving comfort from the belief that we are not "alone" in the universe; (2) the possibility that these advanced forms of life may be willing to help us deal with our technological limitations—in other words, to "save us"; or (3) that flying saucers are here to help us, but in a covert, indirect way such as to save us from our own destruction by preventing a nuclear holocaust, or forcing us to live together as brothers in the way that H. G. Wells in his *War of the Worlds* suggested (for a theological response to this, see Klewin, 1981). Another concern relates to abduction accounts recalled under hypnosis, most of which relate far more to psychological concerns than evidence for UFOs.

A review of many works written to support UFOs argue strongly in their favor on the basis of speculative biological evolution. Given the vast universe, they reason, there must be many planets that could support life and, given the likelihood of a spontaneous origin and evolution of life, many inhabited planets must exist. Sagan—one of the chief popularizers of this view—speculates as to the kind of life found on these planets: "The cosmos may be densely populated with intelligent beings, but the Darwinian lesson is clear: There will be no humans elsewhere . . . in one-billion galaxies, you will not find another . . ." (1980, p. 339). Sagan does admit that,

> Planets may be rarer than we think. Perhaps the origin of life is not so easy as our laboratory experiments suggest. Perhaps the evolution of advanced forms is improbable. Or it may be that complex life forms evolve readily, but intelligence and technical societies require an unlikely set of coincidences—just as the evolution of the species depended on the demise of the dinosaurs and the ice-age recession of the forests in whose trees our ancestors screeched and dimly wondered (1980, p. 298).

Whether life exists on other planets is still speculation based on numerous hypotheses and assumptions (Cousins, 1970). Scientists have no direct evidence of physical life elsewhere in the universe, and belief that life must exist in some of the many places that they believe may be hospitable is a conclusion based on faith and assumption, not empirical evidence (Tipler, 1981, p. 143; Simpson, 1964a). There is much that we do not know, and likely many surprises still exist in the universe. The fact that life exists on the earth certainly indicates that whatever occurrences caused it to exist here could cause it to exist elsewhere. Some scientists are optimistic as to life existing elsewhere because of their belief structure—as are many theologians for many of the same reasons. Some theologians reason that because God created life on the earth by no means precludes Him from creating it elsewhere. In addition, they note that since the Scriptures are categorically silent on the question of material life elsewhere, we have no grounds from this source one way or the other. White concludes that ". . . the main reason so many people believe in life on other planets in the universe is that they think that believing this is evidence against a creation world view . . ." (1988, p. 38).

The Science of Exobiology

Although estimates vary widely, A. G. Cameron speculates that about 100,000 planets may exist within our galaxy that could sustain some form of life. If life can evolve of its own accord by natural law, then life can exist where time, chance and chemistry are favorable (McDonough, 1991). Drake estimates that "there may be 10 million extraterrestrial technical societies within our solar neighborhood capable of radio communication beyond their own bio fields" (Thomas, 1971). A new science—exobiology—has arisen to study

life on other planets; its small band of practitioners includes Carl Sagan and Willy Ley (Sagan, 1993; Sullivan, 1990; Drake, 1992; Eberhart, 1989; Lawren, 1990). Interestingly, this whole new "science" has developed to study something for which no empirical proof yet exists (Simpson, 1964; White, 1988). As Abell concluded:

> Today most scientists are highly skeptical of hypotheses of an extraterrestrial origin of UFOs, on the ground that convincing hard evidence for it is lacking. But do not confuse skepticism with narrow-mindedness. It would be hard not to find a scientist who would not be terribly excited if such hard evidence could be found; for what could be a more monumental discovery than proof of life beyond earth? (1976, p. 34).

Although some scientists have concluded that extraterrestrial life must be common in the cosmos, recent evidence is causing many to seriously question this assumption. Long held beliefs that life exists on Mars, Venus, the Moon and elsewhere have been disproved, dashing hopes in finding life in the only places in the universe where we could regularly study and interact with extraterrestrial life (White, 1988). Astronomers have been trying in vain for nearly three decades to detect radio signals originating from outside of the earth which would indicate the existence of another civilization. So far, not one confirmed signal that indicates the existence of an extraterrestrial civilization has been detected. The results, as Klewin notes have dashed:

> . . . the dogged hope that life might exist somewhere else in our solar system . . . [and] the speculation that the pseudo-scientific theories regarding the origins of life can be substantiated by what is found on some other planet. So undoubtedly the search will turn outward to the myriad other stars like our sun, any of which, according to the scientists, could have a similar planetary system. In a sense, it will be a search similar to the one now going on for proof of UFOs that are supposedly either visiting the earth now or that have landed on earth in prehistorical times, made and run by creatures with intelligence from outside our solar system. Or it may be the continuing attempt to bounce radio signals into space in the hope that some intelligent life existing elsewhere in the universe will respond (1981, p. 26).

Newer studies have found that the conditions which are necessary for life to exist are far narrower than was previously believed. Using computer analysis, Jansma (1981, p. 89) concluded that they are so small that it is very likely that ". . . ours is the only advanced civilization in the universe and almost certainly the only one in our galaxy to have life. . . ." (See also Dobzhanski, 1973; Simpson, 1964b; Mayr, 1978.) Recent studies show that even earth just barely qualifies as a suitable abode for life. If the planet earth had been placed in an orbit only five percent closer to the sun, a runaway greenhouse effect could by now have turned the planet into a hothouse—with surface temperatures close to 900° F, the condition that now exists on the planet Venus (Barrow and Tipler, 1986). On the other hand, if the earth was only about one percent farther away, runaway glaciation would by now have enveloped the earth with ice and the planet would now be a barren "desert" similar to Mars. In other words, if the glaciation and melt ratios were changed only slightly, the effect would produce glaciations that would increase until the entire earth was covered by ice. The freezing and melting ratio is now almost perfectly balanced.

Although some scientists have become excited about the discovery of small amounts of amino acids in some meteorites, the jump from such simple organic compounds (called organic only because they are carbon based) to life is incredibly remote. Jansma (1981, p. 90) concludes that ". . . science has still failed to fathom this process, and we cannot assume life would be easily or automatically evolved from simple nucleotides." Even an eminent scientist such as Carl Sagan, long a champion of the position that life exists in outer space, has reluctantly concluded that recent discoveries have reduced the probability of life occurring elsewhere in the universe.

Interestingly, Tipler (1981, p. 140) concludes ". . . the great evolutionists have always been united against ETI. The biologists who have supported ETI have generally been biologists with the viewpoint of a physicist." Biologists generally argue that the enormous complexity of life, and the fact that the ". . . likelihood of the evolution of an intelligent species . . . [is] essentially zero . . . ," strongly argues against the evolution of life elsewhere (Tipler, 1981, p. 140; and see also Faulkes, 1991). This view, though, is not held by large numbers of people, nor by many biologists who specialize in other areas. Many science discoveries which became popular, such as the claim of "canals" on Mars made by Percival Lowell, and the origin-of-life experiments by Stanley Miller, have fueled a belief both in lay persons and scientists that life could have evolved elsewhere in the universe (Sagan, 1980).

Summary

No direct evidence for life on any planet within or outside of our solar system except on earth has been found. Much evidence exists in support of the conclusion that within our solar system, life can exist only on earth, and we can only speculate if it can or does exist elsewhere. The physical laws of the universe, according to our present level of scientific understanding, prohibit traveling the tremendous distances necessary to reach earth from places where it may be possible for life to survive. Further, no evidence exists that an advanced technological society other than our own is either in the earth, in our solar system, or on some place elsewhere. Nor is there any evidence in support of the theory that earth has a sister planet. Therefore, the contention that physical non-natural or human constructed unidentified flying objects exist is largely without foundation.

In the absence of an explanation of where they come from, and in view of the evidence against a source of UFOs, all UFO reports must be critically evaluated. Hypothesizing the purpose of UFOs, as a number of authors have tried, is premature until it can first be proven that they exist. Most of the evidence that has purported to prove UFOs (such as photographs, tape recordings, and eyewitness reports) is not without problems, although not all of this evidence has been conclusively disproved. A number of prominent indi-

viduals accept the existence of UFOs and many eyewitness reports seem to be credible. This in itself, though, does not prove their existence, but only that there is much that we do not know about the universe.

Belief in UFOs also seems to be highly related to the development in the past several hundred years of a new view of the universe as well as, importantly, the development of evolutionary naturalism. Ferris 1988, p. 369) claims that it was historically the materialists that tended to believe life exists on other worlds, and that this life could have visited the earth. Acceptance of UFOs is related and partly dependent upon the theory of evolution that life can arise spontaneously where conditions are appropriate and evolve of its own accord. This hypothesis is a key both to UFO belief and the conclusion that material life exists in the universe aside from the earth. Other theories that purport to explain the existence of life in other areas of the universe include the position that our solar system and the life within it were both created by God. Christian theology has historically taught that the God of the Bible is not just the God of the earth, but of the entire universe, and thus He is the only potential creator of life in other solar systems.

References

CRSQ-Creation Research Society Quarterly.

Abell, George. 1976. One astronomer's views. *The Humanist* 36(1)4-12.

Allnutt, Frank. 1978. Infinite encounters. Fleming H. Revell Company. Old Tappen, NJ.

Armstrong, Harold. 1970. Are there corporeal living beings outside the earth? *CRSQ* 7:38-42.

Barrow, John D. and Frank J. Tipler. 1986. The anthropic cosmological principle. Oxford University Press. New York.

Bergman Jerry. 1993. Teaching evolution through science fiction. *Creation Ex Nihilo Technical Journal* 7:172-180.

Bernard, Raymond. 1979. The hollow earth. Bell Publishing Company. New York.

Buskirk, Michael Van. 1979. Alien UFOs are here. *CARIS* Newsletter 3(2):l-2.

Cantril, Hadley. 1966. The invasion from Mars: A study in the psychology of panic. Harper and Row. New York.

Chambers, Howard. 1967. UFO for the millions. Bell Publishing Company. New York.

Clark, Arthur. 1968. Man in space. Time-Life Books. New York.

Coleman, James. 1954. Relativity for the layman. The Macmillan Company. New York.

Cousins, Frank W. 1970. Is there life on other worlds? A critical reassessment of the evidence. *CRSQ* 7:29-37.

Dobzhanski, Theodosius. 1973. Genetic diversity and human equality. Basic Books. New York.

Downing, Barry. 1968. The Bible and flying saucers. Avon Books. New York.

Drake. Frank. 1992. The search for extraterrestrial intelligence. *Omni* 15(1):6.

Eberhart, Jonathan. 1989. Listening for ET: What if the message comes? *Science News* 135:296-298.

Edwards, Frank. 1966. Flying saucers-serious business. Lyle Stewart. New York.

_____ 1967. Flying saucers—here and now. Lyle Stewart. New York.

Evans. Christopher. 1973. Cults of unreason. Farrar, Straus and Groux. New York.

Faulkes, Zen. 1991. Getting smart about getting smarts; evolutionary biology and extraterrestrial intelligence. *Skeptical Inquirer* 15: 263-268.

Ferris, Timothy. 1988. Coming of age in the Milky Way. William R. Morrow. New York.

Freeman, Hobart. 1969. Angels of light? Logos International. Plainfield, NJ.

Gardner, Martin. 1965. Relativity for the millions. Pocketbooks, Inc. New York.

Goeringer, Conrad. 1979. Close encounters of the halucinary kind. *American Atheist* 21(6):11-14.

Good, Roland H. 1968. Basic concepts of relativity. Reinhold Book Company. New York.

Hoyt, William Graves. 1981. Planets X and Pluto. The University of Arizona Press. Tucson. AZ.

Jansma, Sidney. 1981. UFOs and evolution. Published by author.

Klewin, Thomas. 1981. Why must there be life on Mars? *Good News Broadcaster* Jan, pp. 26-28.

Landau, L. D. and G. B. Rumer. 1966. What is relativity? Fawcett Publications. Greenwich, CT

Lawren, Bill. 1990. Alien back talk. *Omni* 12(5):36.

Lorenzen, Coral. 1966. Flying saucers: The startling evidence of the invasion from outer space. The New American Library. New York.

Lunan, Duncan. 1974. Interstellular contact. Henry Regnery Company. Chicago.

Mayr, Ernst. 1978. Evolution. *Scientific American* 239(3)46-55.

McDonough, Thomas R. 1991. Searching for extraterrestrial intelligence. *Skeptical Inquirer* 15:255-262.

Menger, Howard. 1967. From outer space. Pyramid Books. New York.

Menzel, Donald and Lyle Boyd. 1963. The world of flying saucers. Doubleday and Company. Inc. Garden City, NY.

Michel, Aime. 1956. The truth about flying saucers. Pyramid Books. New York.

Reichen, Charles-Albert. 1963. A history of astronomy. Hawthorn Books. New York.

Rublowski, John. 1962. Is anybody out there? Walker and Company. New York.

Ruppelt, Edward. 1956. The report on unidentified objects. Doubleday and Company, Garden City, NY.

Sagan, Carl and Jonathan Norton Leonard. 1972. Planets. Time-Life Books. New York.

_____. 1980. Cosmos. Random House. New York.

_____, et al. 1993. A search for life on earth from the Galileo spacecraft. *Nature* 365:715-716.

Segraves, Kelly. 1975. The great flying saucer myth. Beta Books, San Diego, CA.

Simpson, George Gaylord. 1964a. The nonprevalence of humanoids. *Science* 143:769-773.

_____ 1964b. The view of life. Harcourt, Brace and World. New York.

Singer, Dorothea Waley. 1950. Giordano Bruno; his life and thought. Henry Schuman. New York.

Stacy, Dennis. 1994. Cosmic conspiracy: Six decades of government UFO cover-ups, part III. *Omni* 16(9):54-56.

Steneck, Nicholas. 1976. Science and creation in the Middle Ages. University of Notre Dame Press. South Bend.

Sullivan, Woodruff T. 1990. Outward searchers. *Science* 250:303. [book review]

Thomas. Andrew. 1971. We are not the first. G. P. Putnam's Sons. New York.

Tipler, Frank. 1981. A brief history of the extraterrestrial intelligence concept. *Journal of the Royal Astronomical Society* 22(3):133-145.

Tralins, Robert. 1974. Supernatural warnings. Popular Library. New York.

Verne, Jules. 1878. Off on a comet; A journey through planetary space. Claxton, Remen and Haffelfinger Philadelphia.

Von Daniken, Erich. 1969. Chariots of the Gods?: Unsolved Mysteries of the Past. G. P. Putnam's Sons. New York.

Von Daniken, Erich. 1972. Gods from outer space. Bantam Books. New York.

Weldon, John. 1976. UFOs; What on earth is happening? Bantam House. New York.

Wells, Ernest H. 1975. Search for life in space. DeHoff Publishing, Murfreesboro, TN.

Wells, Herbert George. 1895. The first men in the Moon in seven famous novels. Garden City Pub. Co. Garden City, NY.

Wells, Herbert George. 1895. The war of the worlds in seven famous novels. Garden City Pub. Co. Garden City, NY.

Wetherill, George W. 1991. Occurrence of earth-like bodies in planetary systems. *Science* 253:535-538.

White, A. J. Monty. 1988. Is there life on other planets? *Creation Ex Nihilo* 10(2):36-38.

Wilkins, Harold. 1955. Flying saucers uncensored. Pyramid Books. New York.

_____ 1967. Flying saucers on the attack. Ace Books. New York.

Wilson. Clifford. 1972. Crash go the chariots. Lancer Books. New York.

_____ 1974. UFOs and their mission impossible. New American Library. New York.

_____ 1975. The chariots still crash. Fleming H. Revell Company, Old Tappan, NJ.